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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project

Date

Author

TITLE

FOREST INSECT SURVEY

FALL RIVER AREA

SHASTA NATIONAL FOREST, CALIFORNIA

Season of 1942

by

P. C. Johnson - C. B. Eaton
Berkeley, California
May 5, 1943

SUBJECT-

INDEX NO.-

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Forest Insect Laboratory
Berkeley, California
May 5, 1943

FOREST INSECT SURVEY
FALL RIVER AREA
SHASTA NATIONAL FOREST, CALIFORNIA
Season of 1942

Approved BY:

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ABSTRACTS OF RESULTS

THE 1941 INFESTATION (Complete record)

Total amount of pine timber killed in the Fall River Area,
Shasta National Forest, California (Table 2):

Number of trees	2,480
Volume	3,520,000 board feet
Average volume per acre	41.1 board feet
Proportion of virgin pine stand	0.2 percent

Classification: Endemic

Primary insects: Western pine beetle in ponderosa pine

Trend: Decrease of 46 percent over 1940 infestation

Control work completed: None recommended

THE 1942 INFESTATION (Partial record)

Classification: Endemic

Primary insects: Western pine beetle in ponderosa pine

Trend: Decrease over 1941

Control work recommended: No direct measures recommended.
Advisable to direct full utilization cutting in this area to remaining stands in Wiley Ranch, Lava, Dana, and Cayton Units for next few years to secure maximum values from these higher insect hazard areas while the present market conditions favor this type of timber.

Forest Insect Survey
FALL RIVER AREA
Shasta National Forest, California

Season of 1942

INTRODUCTION

Forest insect conditions in the eastern part of the Shasta National Forest have greatly changed in recent years as virgin ponderosa pine stands have gradually been replaced by cutover reserve stands. In former years extensive stands of mature ponderosa pine covered the area. The fine timber of the Goosenest country, the old Antelope area, and the pine forests north and east of Bartle have, each in their time, helped to maintain a sizable share of the State's pine lumber industry. The gradual diminishing of the timber resources in these areas has left the Fall River Area as the principal source of timber for future cutting.

Changes in the Forest insect problems have also occurred as the virgin stands have gradually been replaced by cutover reserve stands. Defoliating insects became more abundant as did those insects which attack pine reproduction. Infestations of Ips engraver beetles and the pine bark beetles plagued the reserve stands from time to time and even wiped out these stands over a period of time in some areas. Most of these occurrences have been of minor economic importance even though at times they seriously interfered with the re-establishment of the pine cover. The most serious problem continues to be the loss in merchantable timber stands caused by the attacks of bark beetles.

Wartime limitations made it necessary to restrict the 1942 survey of forest insect conditions to the virgin pine stands of the Fall River Area. The survey was made November 4, 1942, by the writers who used three newly established roadside strips totalling 400 acres to estimate the current insect-caused stand mortality throughout the area. (Figure 1). These strips were representative of the most common stand conditions, and while the infestation remains uniformly low, they may suffice as a sampling base for the entire area. It seems desirable, however, to increase the number of samples before the 1943 survey is made so that any localized fluctuations in the infestation may be observed.

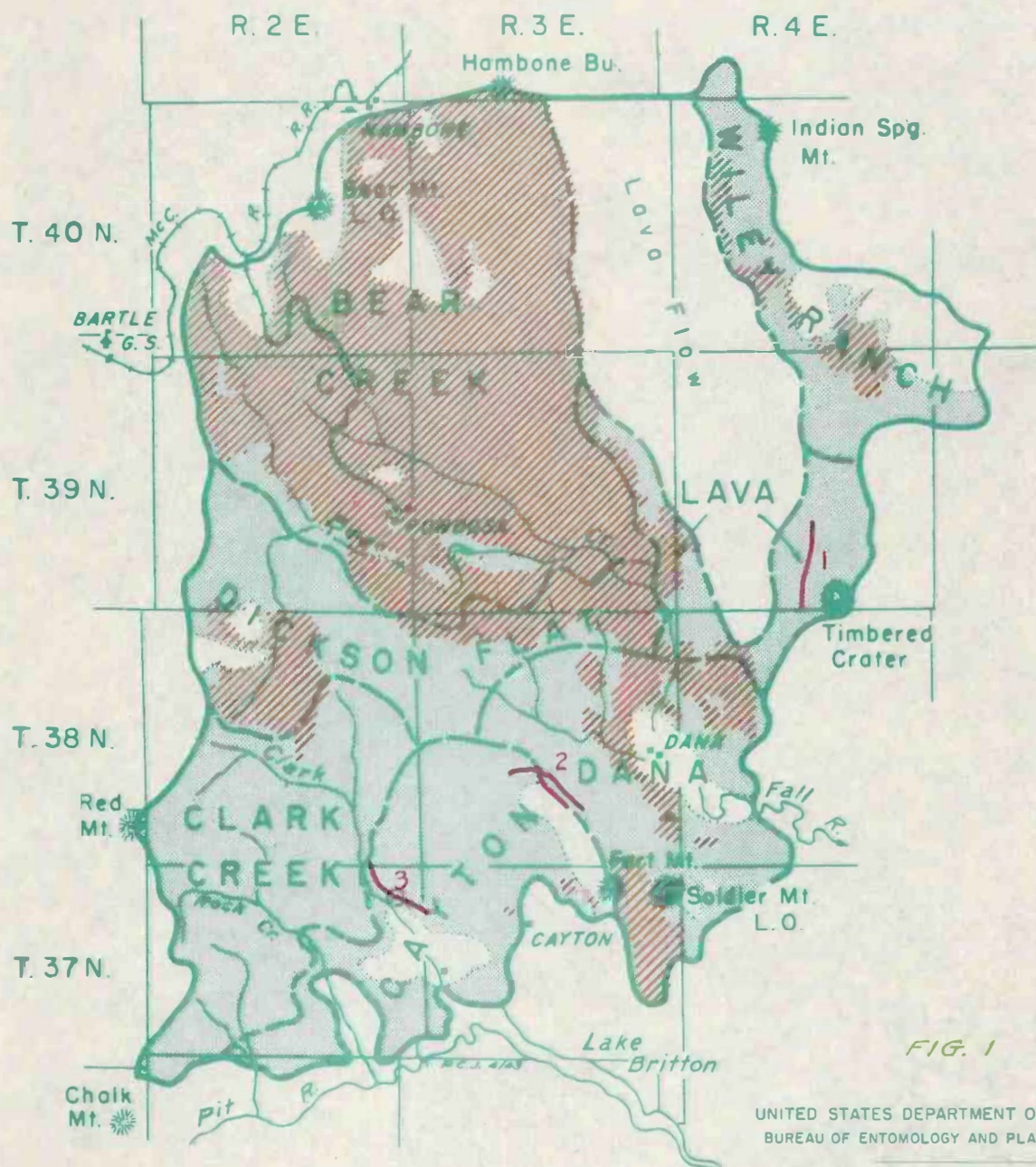


FIG. 1

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT SURVEY

FALL RIVER AREA
SHASTA NATIONAL FOREST, CALIFORNIA

SEASON OF 1942

SCALE 0 2 4 6 MILES

LEGEND

- Pine Timber Type
- Cutover Land, as of 1/1/42
- Boundary Lines
- Reporting Areas
- Entomological Units
- Ground Samples
- Plot
- Roadside Strips
- Line Strips
- Line Plots
- Road Counts

THE 1941 INFESTATION

The last full calendar year's estimates of beetle-killed pine are those for 1941 which have been completed by data obtained in the 1942 survey. It is included here primarily as a matter of record, for when added to the estimates of previous years it provides an increasingly important history of the infestations in this area. An analysis of these long-term records often discloses conditions which materially affected the rise and fall of past infestations and which may serve to forewarn of future outbreaks. These annual summaries are useful in determining the adjustments which occasionally must be made in the stand inventories as a result of heavy beetle infestations.

Insects Involved.

The western pine beetle, Dendroctonus brevicornis Lec., continued its primary role in ponderosa pine. The basal examinations of the trees killed by this insect revealed its attacks to be weak and seemingly less aggressive than in previous years. Phloem areas were often shared with attacks of secondary insects, usually those of the emarginate engraver beetle, Ips emarginatus Lec. In some of the infested trees examined, large areas of phloem in the butt logs were devoid of any insect attacks though there were often evidences of attacks in the bole regions above.

Attacks of the mountain pine beetle, Dendroctonus monticolae Hopk., in sugar pine were practically non-existent. In fact, not a single currently killed sugar pine was found either on the sample strips or on the reconnaissance of the entire area.

Pine Mortality on the Sample Strips.

Pine trees above ten inches d.b.h. which had been killed by beetles on the sample strips during 1941 or 1942 were located and examined, marked and mapped. The infested trees measured in this operation were made up entirely of ponderosa pine. The amount of pine killed in 1941 ranged between 31 and 42 board feet per acre (Table 1) and from 0.2 to 0.3 percent of the pine stand.

Table 1. Pine timber killed by bark beetles on virgin sample strips.
Fall River Area, Shasta National Forest, California. Season of 1941.

ENTOMOLOGICAL UNIT	Strip No.	Timbered Acreage	Insect Hazard Rating	PINE STAND*		LOSS FOR 1941			
				Tree Spp.	Volume (m.b.m.)	No. of trees	Volume (b.m.)	Volume per acre of stand	Percent
Lava	RD-1	160	III	PP	1,510	8	4,990	31.2	0.3
Dana	RD-2	160	III	PP	2,760	3	7,520	47.0	0.3
Clark Creek	RD-3	80	II	PP	2,070	2	3,380	42.2	0.2

* Pine stand volume estimates as of January 1, 1938.

There appeared to be no outstanding differences in the infestations on the three strips except in the number of trees infested per unit area and the size of the infested trees. These things appear to be related to certain stand characteristics, as indicated:

Strip No.	Site	Pine Stand Per acre	TREES KILLED 1941	
			No. Per acre	Volume per tree
RD-1	IV	9,450	.050	624
RD-3	II-III	12,950	.025	1,690
RD-2	III	17,240	.019	2,507

The western pine beetle, in 1941, appeared to exhibit a very high degree of selectivity in its choice of host trees for, in nearly every case, the trees attacked by these beetles were widely scattered and definitely among the most weakened trees in the stand as evidenced by external appearances of the crowns. Most of them were overmature and many had been topkilled before by other insects or had suffered mechanical damage from lightning and wind.

Estimated Pine Mortality by Forest Areas.

Approximately 3,500,000 board feet of ponderosa pine was killed in 1941 in the Fall River Area. The distribution of this loss by units is given in Table 2.

Table 2. Pine timber killed by bark beetles. Fall River Area, Shasta National Forest, California. Season of 1941.

ENTOMOLOGICAL UNIT	PINE TYPE ACREAGE (January 1, 1942)			VIRGIN PINE STAND		TIMBER KILLED 1941			
	Virgin	Cut-over	Total	Spp.	(M b.m.)	Trees No.	VOLUME		
							M b.m.	b.m./ac.	% stand
Wiley Ranch	7,670	2,600	10,270	PP	80,380	340	270	35.0	0.3
Lava	6,940	1,540	8,480	PP	50,000	350	220	31.2	0.4
Bear Creek	2,560	42,190	44,750	PP	54,820	70	100	40.0	0.2
Dickson Flat	18,390	7,880	26,270	PP	338,080	460	780	42.2	0.2
				SP	124,820	none	none	none	none
Clark Creek	21,660	200	21,860	PP	226,660	540	910	42.2	0.4
				SP	192,610	none	none	none	none
Cayton	15,840	160	16,000	PP	139,540	350	710	44.6	0.5
				SP	31,900	none	none	none	none
Dana	12,610	6,390	19,000	PP	162,230	370	530	41.7	0.3
				SP	40,950	none	none	none	none
TOTALS	85,670	60,960	146,630	PP	1,051,710	2,480	3,520	41.1	0.3
				SP	390,280	none	none	none	none
				PP-SP	1,441,990	2,480	3,520	41.1	0.2

There appears to be no outstanding feature of the infestation in any part of the area. The rate of losses was so uniform that the differences in the unit totals exist almost solely because of the differences in virgin timbered acreage between the units.

Trend of the Infestation.

The 1941 infestation level was the lowest of the last decade (Figure 2). The trend of the infestation during the past few years has been similar to that on other pine areas in northeastern California, but at a somewhat lower level. This latter condition is believed due to the greater abundance of better site and climatic conditions which prevail in the Fall River Area.

The infestation has remained in an endemic stage since 1936 and this has allowed the gross growth of the stands to exceed the loss from insects. Prior to 1936 there were several epidemic outbreaks, the last of which occurred in 1932 and, presumably, in 1935. No survey was made the latter year, but a general heavy increase in beetle infestations was noted throughout most of the other northeastern California pine areas this same year.

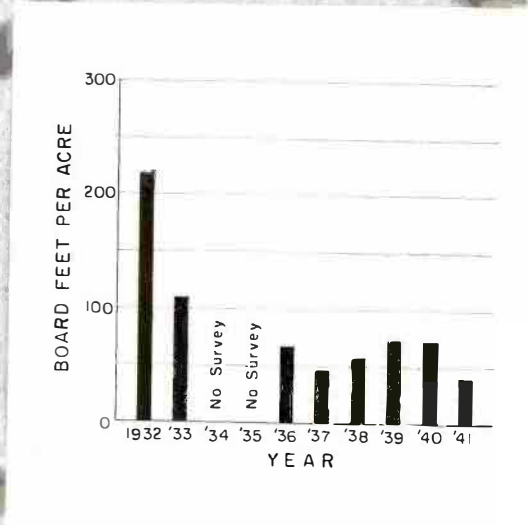


Figure 2. Trend of the bark beetle infestations in the Fall River Area, Shasta N.F., Calif., from 1932 to 1941, inc.

THE 1942 INFESTATION

It is estimated that nearly 80 percent of the 1942 infestation had appeared when the 1942 survey was made. There is every indication to believe that the pine losses for the full calendar year 1942 will not only continue to be endemic, but that the losses will be less than those in 1941. An examination of the trees which had been attacked late in the fall of 1942 did not reveal the signs of aggressive insect development which would have signalled the sudden increase either in the tail-end 1942 attacks or the early 1943 attacks.

The 1942 infestation was very similar in character to the 1941 infestation previously described. The insects involved, the kinds of trees attacked, and the distribution of infested trees throughout the stands were practically identical.

INSECT CONTROL RECOMMENDATIONS

The current infestation is at a very low ebb and no control measures are necessary at this time.

It should be pointed out, however, that the over-all insect hazard of the Fall River Area could be considerably improved by concentrating normal logging operations for the next few years in the lower elevation stands of the Wiley Ranch, Lava, Dana, and Cayton Units. These stands are lighter in volume per acre and the lower log grades appear to be more abundant. The war lumber markets have so far proved to be an ideal outlet for such timber. To remove it now, without extra equipment or men, will be to accomplish a definite measure of insect control; for it is believed that these areas will be the source of future insect epidemics if these virgin stands remain intact while other less hazardous stands are cut first.